

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Cancelled)
2. (Cancelled)
3. (Cancelled)
4. (Cancelled)
5. (Cancelled)
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22. (Cancelled)
23. (Cancelled)
24. (Original) A probe system for sensing process conditions within an ultrasonic process tank of the type that includes process liquid, the liquid being subjected to ultrasound produced by transducers coupled to a generator, comprising:
 - (a) an enclosure for housing a sample liquid, the enclosure passing ultrasonic energy from the process liquid to the sample liquid, the sample liquid being responsive to the energy; and
 - (b) one or more sensing transducers within the sample liquid, the transducers generating signals indicative of characteristics of the sample liquid.

25. (Original) A probe system of claim 24, wherein the housing comprises polypolyene.
26. (Original) A probe system of claim 24, wherein one transducer comprises means for determining the conductivity of the sample liquid and for generating a signal indicative of the conductivity.
27. (Original) A probe system of claim 24, wherein one transducer comprises means for determining the temperature of the sample liquid and for generating a signal indicative of the temperature.
28. (Original) A probe system of claim 24, further comprising a temperature transducer attached to the outside of the housing for determining a temperature of the process liquid and for generating a signal indicative of the temperature.
29. (Original) A probe system of claim 24, further comprising an analysis subsystem for collecting the signals and for evaluating the signals over time.
30. (Original) A probe system of claim 29, wherein the subsystem comprises means for generating control signals which control the generator in response to evaluated signals over time.
31. (Original) A probe system of claim 29, wherein the subsystem comprises a microprocessor.
32. (Original) A probe system of claim 29, further comprising means for determining total cavitation energy released based upon signals indicative of temperature of the sample liquid over time.
33. (Original) A probe system of claim 29, further comprising means for calculating total energy released from cavitation through the following relationship: $\text{energy (calories)} = \text{specific heat} \times \text{mass of the sample liquid} \times \text{change in temperature (}^{\circ}\text{C)}$.
34. (Original) A probe system of claim 29, further comprising means for determining cavitation density based upon signals indicative of conductivity of the sample liquid.
35. (Original) A probe system of claim 34, further comprising means for determining cavitation density as a function of time.
36. (Original) A probe system of claim 29, wherein the subsystem comprises memory for storing at least one of the following parameters: specific heat (p) of the sample liquid, volume (V) of the sample liquid, mass (m) of the sample liquid, and a functional relationship defined as $n=f(C,C_0)$ between conductivity and a number (n) of cavitation implosions.

37. (Original) A probe system of claim 36, further comprising means for calculating cavitation density based upon $n/V=f(C,C_o)/V$.
38. (Original) A probe system of claim 3,6, further comprising means for calculating energy in each cavitation implosion based upon $(0.00833)(p)(m)(g(t'))/V/ f(C,C_o)/t'$, where t' corresponds to a time of measurement.
39. (Original) A probe system of claim 36, further comprising means for calculating cavitation density based upon cavitation density as a function of time = $f(h(t))/V$.
40. (Original) A probe system of claim 36, further comprising means connected to the generator for controlling the generator based upon calculations of the subsystem.
41. (Original) A probe system of claim 40, further comprising one or more comparators for comparing the calculations to one or more stored parameters.
42. (Original) A probe system of claim 29, wherein the subsystem comprises feedback means for controlling generator frequency in response to the signals.
43. (Original) A probe system of claim 29, wherein the subsystem comprises feedback means for controlling generator power output in response to the signals.
44. (Original) A probe system of claim 29, wherein the subsystem comprises feedback means for amplitude modulating signals from the generator to control cavitation density as a function of time within the process liquid.
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